CLAIMS

What is claimed is:

1. An apparatus for use in generating a desired intensity prescription, comprising:

an input surface; and

an optically active output surface receiving a collimated beam, wherein the output surface refractively maps an illuminance distribution of the collimated beam into a prescribed intensity pattern;

wherein the input and output surfaces at least in part define a volume of transparent dielectric.

2. The apparatus of claim 1, wherein the output surface includes a plurality of sections with disconnects between at least two of the plurality of sections.

3. The apparatus of claim 1, further comprising:

a collimating lens that collimates an input beam to generate the collimated beam; and

wherein the input surface is positioned proximate the collimating lens to receive the collimated beam.

4. The apparatus of claim 3, wherein the input surface is a planar surface.

5. The apparatus of claim 1, wherein the output surface generates the prescribed intensity pattern such that the prescribed intensity pattern is rotationally symmetric.

6. The apparatus of claim 5, wherein the output surface is rotationally symmetric.

7. The apparatus of claim 1, wherein the output surface is symmetric along an axis.

8. The apparatus of claim 1, wherein the output surface is defined according to a cumulative illumination integral for the illuminance distribution and a cumulative illumination integral of the intensity pattern.

9. A method for use in defining a lens profile, comprising:

determining an illumination integral for an illuminance pattern of an input beam;

determining a far-field intensity prescription;

establishing a one to one spatio-angular correspondence of transverse location of the input beam with direction in the intensity prescription;

deriving surface normal vectors of an output surface of the transverse locations across the input beam; and

determining the output surface according to the surface normal vectors.

10. The method of claim 9, further comprising:

determining a normalized cumulative illumination integral for the far-field intensity prescription.

11. The method of claim 10, wherein the determining the illumination integral further comprises determining a normalized illumination integral for the transverse illuminance pattern.

12. The method of claim 11, further comprising:

determining modifications for the output surface; and

applying modifications to the output surface to attain the intensity prescription.

13. The method of claim 9, further comprising:

collimating the input beam generating a collimated input beam; and

the determining the illumination integral for the illuminance pattern of the input beam comprises determining the illumination integral for the illuminance pattern of the collimated input beam.

14. The method of claim 13, wherein the determining the output surface according to the surface normal vectors comprises determining the output surface so that the intensity prescription is a rectangular pattern.

15. The method of claim 9, wherein the establishing a one to one spatio-angular correspondence comprises assigning a unique far-field divergence angle to a plurality of spatially related radiuses within the input beam.

16. A method for use in defining a lens profile, comprising:

determining an intensity prescription;

determining an illuminance pattern of an input beam; and

defining an optically active surface of a lens, comprising:

integrating a cumulative flux distribution of the determined illuminance pattern;

integrating a cumulative flux distribution of the determined intensity prescription and obtaining first and second factored profile angles;

sweeping the first profile angle along a space defined by the second profile; and

defining the optically active surface according to the sweep of the first profile angle.

17. The method of claim 16, further comprising:

modifying the determined optically active surface at perimeters of the determined active surface.

18. The method of claim 17, further comprising:

determining a subsequent intensity prescription according to the defined optically active surface;

repeating the defining of the optically active surface of the lens; and

determining a subsequent optically active surface according to the subsequent intensity prescription.

19. The method of claim 16, wherein the integrating the cumulative flux distribution of the determined illuminance pattern comprises calculating a one dimensional integration for a first axis and calculating a one dimensional integration for a second axis; and

wherein the integrating the cumulative flux distribution of the determined intensity prescription comprises calculating a one dimensional integration for the first profile angle and calculating a one dimensional integration for the second profile angle.

20. The method of claim 19, wherein the integration of the first axis and the integration of the second axis are made equal to a cross-section of the input beam, where the input beam is circularly symmetric.